

State of Montana

SIXTH BIENNIAL REPORT

OF THE

STATE FORESTER



TO

Hon. Samuel V. Stewart
GOVERNOR

1919-1920

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HELENA, MONTANA

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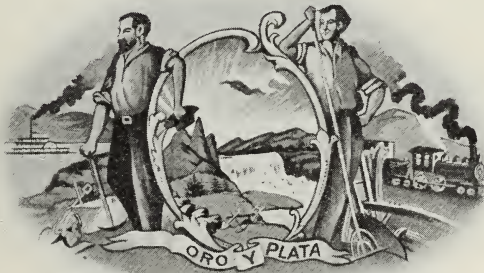
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INDEPENDENT PUBLISHING CO.
HELENA, MONTANA
ESTABLISHED 1890

LETTER OF TRANSMITTAL.

Capitol Building, Helena, Mont., Dec. 1, 1920.

To His Excellency,
Hon. Samuel V. Stewart,
Governor of Montana.

Dear Sir:

In accordance with the provisions of Section 10, Chapter 147, Laws of 1909, I have the honor to transmit herewith the Sixth Biennial Report of the State Forester for the years 1919 and 1920.

Very respectfully,

JOHN C. VAN HOOK,
State Forester.

STATE FORESTRY BOARD.

SIDNEY MILLER.....Register of State Lands, Chairman
CHAS. A. WHIPPLE.....State Land Agent
JOHN C. VAN HOOK.....State Forester

STATE FORESTER'S OFFICE.

JOHN C. VAN HOOK.....State Forester
H. L. SHERLOCK.....Field Representative
CHAS. S. CAIRNCROSS.....Field Representative

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STATE TIMBER LANDS SELECTED

Under Exchange Agreement and Proclamation by the President.

AREA	TIMBER VOLUME
100,000 Acres.	618,000,000 Feet

STATE TIMBER LANDS EXAMINED, APPRAISED, TIMBER CRUISED, PERMITS AND CONTRACTS ISSUED.

Fiscal Year	Land-Acres	Timber-Feet
1918-1919	11,802	92,506,000
1919-1920	640	533,500
	12,442	93,039,500

PERMITS ISSUED—(CLASS B)

For DEAD DOWN Timber, for Domestic Purposes, Free of Charge.

Fiscal Year	Number Issued	Amount—Cords
1918-1919	155	1,184
1919-1920	141	1,159
	296	2,343

PERMITS ISSUED—(CLASS A)

Fiscal Year	Number Issued
1918-1919	124
1919-1920	270
Total	394

FOR TIMBER FOR DOMESTIC PURPOSES, AT NOMINAL PRICE.

Material	Quantity	Amount
Saw Timber	460,820 Feet	\$ 876.58
Building Logs	1,391 Logs	330.70
Fence Posts	20,496 Posts	372.33
Fence Poles	5,856 Poles	184.80
Wood	1,086 Cords	465.90
Total		\$ 2,230.31

FOR COMMERCIAL PURPOSES.

Material	Quantity	Amount
Saw Timber (Damaged)	6,611,190 Feet	\$ 10,856.13
Saw Timber (Green)	2,048,470 Feet	6,322.39
Tie Timber (Damaged)	5,350 Ties	343.80
Tie Timber (Green)	51,732 Ties	5,584.09
Wood	2,609 Cords	1,028.20
Total		\$ 24,134.61

TIMBER SOLD UNDER CERTIFICATE OF PURCHASE.

Material	Quantity	Amount
Saw Timber	3,289,119 Feet	\$ 9,995.58
Tie Timber	5,320 Ties	394.24
Fence Poles	6,000 Poles	15.00
Total		\$ 10,404.82

MERCHANTABLE TIMBER SOLD UNDER CONTRACT.

Material	Quantity	Amount
Saw Timber (Green)	35,595,951 Feet	\$113,242.51
Saw Timber (Damaged)	1,053,440 Feet	1,053.44
Tie Timber	247,574 Ties	25,871.13
Wood	187 Cords	93.37
Total		\$140,260.45

SIXTH BIENNIAL REPORT

TIMBER SOLD ON TIMBER LAND EXCHANGE AREA: RECEIPTS
TRANSMITTED FOR CREDIT TO SIDNEY MILLER, TRUSTEE FUND.

Material	Quantity	Amount
Tie Timber	17,750 Ties	\$ 2,029.65
Lath Bolts	500 Cords	375.50
Mill Site		10.00
Total		\$ 2,415.15

Recapitulation:	Permits A—Domestic	\$ 2,230.31
	Permits A—Commercial	24,134.61
	Certificate Purchase	10,404.82
	Contracts	140,260.45
	Exchange Area	2,415.15

TOTAL TIMBER SALES, BIENNIAL PERIOD\$179,445.34

At the close of the fiscal year, November 30th, 1920, there is in operation existing contracts and permits for the sale of timber for an approximate sum of Two Hundred Thousand Dollars (\$200,000).

FINANCIAL STATEMENT.

The Receipts and Expenditures for the Past Eight Years Are as Follows:

RECEIPTS:

1913	\$ 4,688.44
1914	22,689.88
1915	20,079.62
1916	19,938.33
1917	20,922.97
1918	30,139.32
1919	72,815.76
1920	111,399.32

EXPENDITURES:

1913	\$ 8,693.02
1914	11,537.10
1915	13,481.08
1916	12,251.71
1917	24,614.95
1918	18,962.05
1919	61,814.60
1920	32,934.41

RECEIPTS IN DETAIL FOR THE FISCAL YEAR ENDING NOV. 30, 1919.

Timber sold at public auction (Contracts)	\$ 63,818.10
Sold under Certificate of Purchase	5,299.44
Permit A—Commercial	2,573.36
Permit A—Domestic	738.80
Reimbursement on Fire Expense	355.48
Rebate on expired Mileage Books	15.58
Collection for timber rental	15.00

TOTAL RECEIPTS—FISCAL YEAR 1919\$ 72,815.76

RECEIPTS IN DETAIL FOR THE FISCAL YEAR ENDING NOV. 30, 1920.

Timber sold at public auction (Contracts)	\$ 76,442.35
Permit A—Commercial	21,561.25
Permits A—Domestic	1,491.51
Sold under Certificate Purchase	5,105.38
Exchange Area, Sidney Miller, Trustee Fund	2,415.15
Reimbursement for Fire Expense	4,378.68
Lath Mill Site	5.00

TOTAL RECEIPTS—FISCAL YEAR, 1920\$111,399.32

STATE FORESTER

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EXPENDITURES IN DETAIL FOR FISCAL YEAR ENDING NOV. 30, 1919.

GENERAL EXPENSE:

Salary	\$ 10,737.37
Travel	1,006.45
Office	943.57
Field	2,901.27

TOTAL GENERAL EXPENSE	\$ 15,588.66
Refund Timber Sales, Account Land Relinquished.....	75.00

FIRE EXPENSE:

Salary (Weeks Law Patrolmen)	\$ 3,930.38
Wages (Fire Fighters)	23,121.10
Transportation	7,120.09
Subsistence	8,310.71
Equipment	977.32
Regular Assessment N. Mont. Forestry Ass'n	1,793.91
Cooperative Road and Trail Building	466.05
Printing Fire Laws Permits, Signs, etc.	351.36
Fire Warden Badges	9.00
Publicity Fire Warning Notices	41.59
Telegrams and Telephone	29.43

TOTAL FIRE EXPENSE	\$ 46,150.94
TOTAL EXPENSE—FISCAL YEAR 1919	\$ 61,814.60

EXPENDITURES IN DETAIL FOR FISCAL YEAR ENDING NOV. 30, 1920.

GENERAL EXPENSE.

Salary	\$ 13,618.52
Travel	660.00
Office, Including Accident Insurance	916.84
Field	3,484.23

TOTAL GENERAL EXPENSE	\$ 18,679.59
Refunds made on Timber Sales	382.30

FIRE EXPENSE:

Salary (Weeks Law Patrolmen)	\$ 4,058.23
Wages (Fire Fighters)	2,364.62
Accident Insurance, Fire Employees	215.09
Transportation	698.01
Subsistence	674.92
Equipment	23.53
Special Ass'mt N. Mont. F. Assn., 1919 Fires.....	3,587.82
Regular Ass'mt N. Mont. F. Assn., 1920 Fires.....	1,759.53
Cooperative Road and Trail Building	400.00
Publicity, Fire Warning Signs, etc.	48.05
Telephone and Telegrams	24.72
Fire Warden Badges	18.00

Total Fire Expense	\$ 13,872.52
TOTAL EXPENSE—FISCAL YEAR 1920	\$ 32,934.41

TIMBER LAND RECEIPTS GREATER THAN NON-TIMBER LANDS.

Sales of timber compared with sales of non-timbered lands owned by the state, during the years 1919 and 1920, show the following:

Sales of timber on state lands from which all merchantable timber was sold, averaged for the timber alone, per acre.....	\$28.12
Non-timbered lands sold, averaged per acre.....	15.39

This emphasizes the value of timber lands to the state from the standpoint of finance alone, besides title of the land remains with the state for the growing of future timber crops, as well as water conservation and grazing value.

RECEIPTS AND DISBURSEMENTS OF NATIONAL FOREST FUNDS.

Twenty-five per cent of the receipts of the national forests is devoted to the support of the common schools.

For the fiscal years ending June 30th, 1919 and 1920, the proportion to which Montana is entitled is as follows:

National Forests	1919	1920
Absaroka	\$ 2,603.27	\$ 2,635.65
Beartooth	3,687.14	3,441.89
Beaverhead	10,765.59	7,989.81
Bitterroot	5,939.65	5,842.12
Blackfeet	1,854.12	4,314.89
Cabinet	909.77	1,315.92
Custer	6,704.89	6,222.60
Deer Lodge	10,566.82	8,010.25
Flathead	10,254.20	2,861.76
Gallatin	2,973.50	2,712.85
Helena	5,753.21	5,177.16
Jefferson	6,585.76	7,200.06
Kootenai	3,531.65	9,546.19
Lewis & Clark	1,995.76	1,506.26
Lolo	5,849.42	4,856.81
Madison	10,997.94	11,158.53
Missoula	2,351.08	1,943.84
Sioux	1,719.04	1,280.60
Totals	\$95,042.81	\$88,017.19

DISTRIBUTION OF FOREST RESERVE FUND, BY COUNTIES, 1919 AND

1920.	1919	1920
Counties		
Beaverhead	\$11,674.54	\$ 8,947.96
Broadwater	1,271.77	1,131.83
Carter	1,719.04	1,280.60
Carbon	1,709.93	1,578.35
Cascade	2,519.64	2,728.35
Choteau	189.36	205.02
Custer	34.97
Deer Lodge	3,205.89	2,271.92
Fallon	13.79
Fergus	1,173.75	1,273.17
Flathead	9,142.12	4,960.42
Glacier	62.74	47.17
Gallatin	4,182.38	3,982.74
Granite	2,108.72	1,667.28
Jefferson	5,257.37	4,055.55
Lewis & Clark	3,377.76	2,663.39
Lincoln	4,292.39	11,167.95
Madison	8,590.07	8,533.32
Meagher	2,825.46	2,933.17
Mineral	4,082.24	3,322.70
Missoula	2,806.98	1,926.70
Musselshell	150.09	162.73
Park	2,812.91	2,739.45
Phillips	180.26	195.43
Pondera	299.28	225.92
Powell	3,361.46	2,006.70
Powder River	5,170.36	4,797.40
Ravalli	5,940.79	5,800.36
Rosebud	1,543.87	1,425.20
Sanders	65.37	1,403.41
Silver Bow	2,098.10	1,643.72
Stillwater	490.40	452.45
Sweetgrass	1,715.87	1,631.86
Teton	614.96	464.19
Wheatland	358.18	390.78
Totals	\$95,042.81	\$88,017.19

In addition to the foregoing 25 per cent distributed to the common school fund of the counties, 10 per cent of the receipts from national forests is devoted to road and trail building within and adjacent to the national forest reserves in the counties from which the receipts are derived, the expenditure being under the jurisdiction of the National Forest Service.

FOREST FIRES.

An extremely dry period of several years brought about a forest fire situation during the summer of 1919 that was very serious; beyond doubt the most serious ever experienced in Montana. This department, with its limited organization, encountered the menace with all available means at its command, at a corresponding and greatly increased expense to the state. The fire season of 1920 was below the average.

The following summary is submitted of forest fires suppressed by this department, as well as those extinguished by other protective agencies, for the years 1919 and 1920:

STATE FIRES.

Year	No. Fires	Acres Burned	Cost	Damage
1919	103	33,677	\$ 39,529.22	\$ 201,273.00
1920	29	4,975	3,624.39	16,100.00
Totals	132	38,652	\$ 43,153.61	\$ 217,373.00

Northern Montana Forestry Association Fires.				
Year	No. Fires	Acres Burned	Cost	Damage
1919	68	12,594	\$ 15,283.92	\$ 84,573.00
1920	40	3,137	3,796.82	10,000.00
Totals	108	15,731	\$ 19,080.74	\$ 94,573.00

Flathead Indian Reservation Fires.				
Year	No. Fires	Acres Burned	Cost	Damage
1919	57	20,360	\$ 13,000.00	\$ 29,740.00
1920	Not reported.			

National Forest Service Fires.				
Year	No. Fires	Acres Burned	Cost	Damage
1919	1,587	505,251	\$ 1,152,250	\$1,335,529.00
1920	818	17,234	173,200	62,499.00
Totals	2,405	522,485	\$ 1,325,450	\$1,398,028.00

ALL AGENCIES FOR THE TWO YEAR PERIOD.

	No. Fires	Acres Burned	Cost	Damage
Totals	2,702	597,228	\$1,400,684.35	\$1,739,714.00

Causes of All Fires Reported.

Light- ning	Railway	Campers	Brush Burning	Incen- dary	Lumber- ing	Unknown	Miscel- laneous	Total
1,124 43%	433 16%	403 15%	190 7½%	97 3½%	32 1½%	271 10%	94 3½%	2,644 100%

FOREST FIRES ON VACANT PUBLIC LANDS.

To protect the timber lands of the state, and especially the timber owned by the state, from destruction by fire, this department pursues the policy of attacking the fire as quickly as possible, without regard to the ownership of the land upon which the fire is burning.

During the season of 1919 the department suppressed forest fires on vacant public lands belonging to the federal government at an expense to the State of Montana in the sum of Twenty-six Thousand Seven Hundred Forty-six and 17/100 Dollars (\$26,746.17). The said forest fires were outside the boundaries of the national forest reserves, and do not come under the terms of the cooperative agreement between the State of Montana and the Department of Agriculture.

Maps showing the burned area of such fires and ownership of the lands, together with verified statements of all items of expense incurred by the state in their suppression, were prepared and forwarded to Hon. Clay Tallman, Secretary of the Interior, Washington, D. C., with claim for reimbursement.

Mr. Tallman has replied and formally approves said statements and claim, and states as follows: "There are no available funds from which this office can reimburse the State of Montana for this expenditure. If, however, the State of Montana submits to Congress a bill for reimbursement of this expenditure, this office will be in a position to make report with appropriate recommendation, provided the bill is referred to this department for report."

Accordingly this department submitted the matter to the Montana congressional delegation, with the result that bills have been introduced in both branches of the Sixty-sixth Congress to reimburse the State of Montana in the said sum of \$26,746.17, money expended for suppression of forest fires on government lands during the year 1919.

SUPPRESSION OF FOREST FIRES ON PRIVATELY OWNED LANDS.

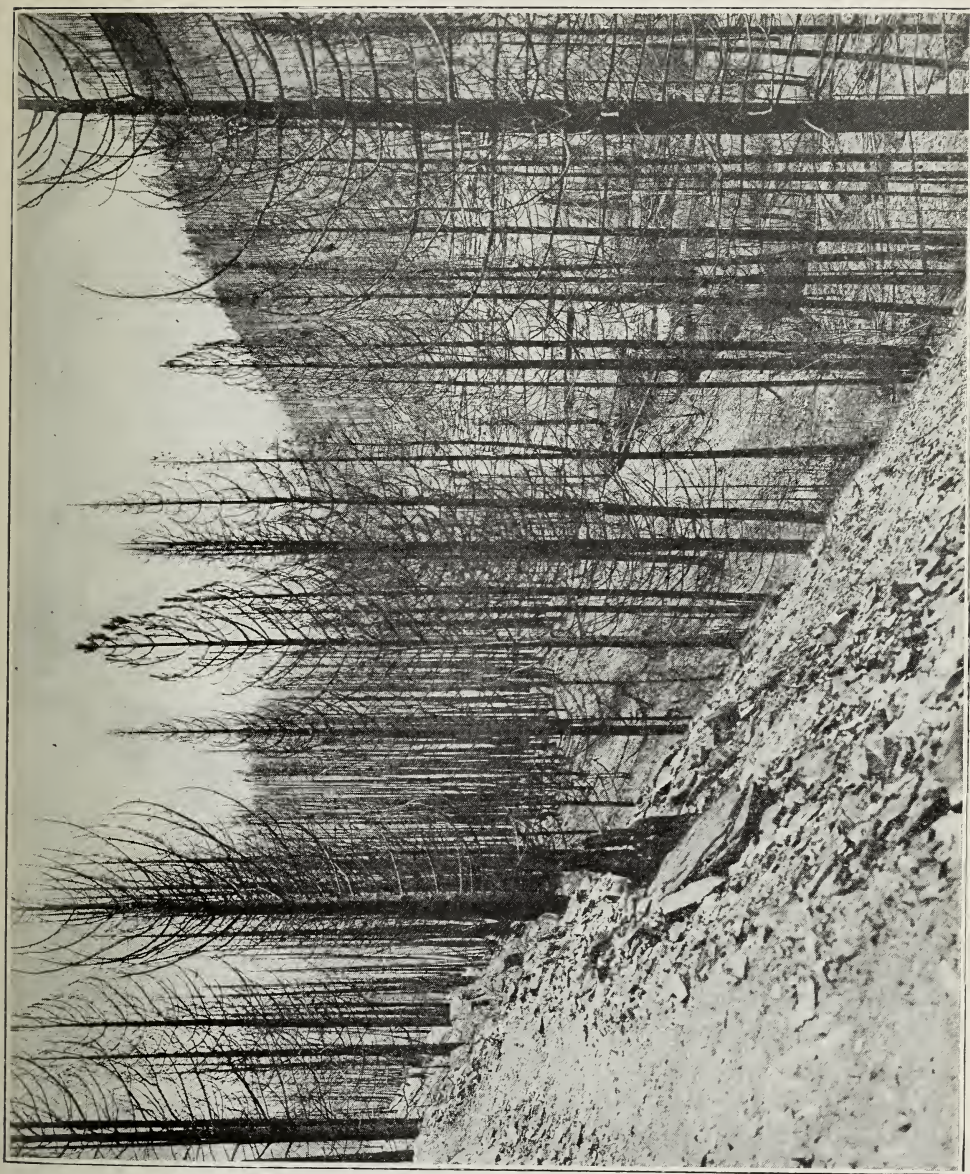
In the absence of any explicit law requiring the owners of timber lands to bear the expense of suppressing and extinguishing fires on such lands or to adequately patrol the same, this department has made every effort to secure reimbursement of expenses incurred in the extinguishment of fires on privately owned lands. In a very few cases we have been successful, the majority having failed to reimburse the state for such expense.

During the year of 1919 the department extinguished forest fires on lands owned by the Northern Pacific Railway Company, at an expense of \$4,160.35, and upon presenting a claim for reimbursement, I am pleased to state, the said company recognized the obligation and promptly remitted the amount, as shown by receipts in my financial statement.

In addition to the employment of patrolmen for the protection of merchantable timber lands, it has been found desirable to patrol timber-grazing lands, and in this connection I desire to report the assistance received from the following live stock interests that cooperated and shared equally with the state in the employment of a patrolman during the seasons of 1919 and 1920:

Beartooth Stock Company, Sieben Live Stock Company and Austin Land & Live Stock Company.

This cooperation was very much appreciated and it is to be hoped the live stock interests generally will see fit to render similar assistance in the protection from fire of their grazing lands.





MONTANA FOREST FIRE LAWS.**Senate Bill No. 49.**

A Bill for an Act Entitled: "An Act Providing a Closed Season for the Burning of Forest Material Without a Permit, Providing Penalties for Setting Fires Contrary to the Provisions of This Act, and Making It the Duty of the County Attorney to Prosecute Offenders, and Providing a Penalty for Failure to Prosecute."

Be It Enacted by the Legislative Assembly of the State of Montana.

Section 1. In this Act, unless the context or subject matter otherwise requires, the word "forester" shall mean the State Forester, or any of his subordinate officers; "warden" shall be held to mean "Fire Warden"; "ranger" to mean "forest ranger," or any duly appointed forest officer of the United States Forest Service; "ranger" shall be held to mean "forest rangers"; "person" shall be held to include "firm or corporation," and "forest material" shall be held to mean "forest, slashing, stumpland, chopping, woodland or brushland"; "camp fire" shall be held to mean "any fire set for any purpose other than the disposal of forest material."

Section 2. All duly appointed officers of the United States Forest Service, the Northern Montana Forestry Association, and the United States Indian Service, are hereby made ex-officio fire wardens and shall have authority to enforce and carry out the provisions of this act. Said officers are to serve without compensation from the state.

Section 3. No person shall burn any forest material within the State of Montana during the period from June 1 to September 30 inclusive of each year, which period is hereby designated as the closed season, without first obtaining permission in writing from the forester, a warden or a ranger, and afterwards complying with the terms of said permit; said permit shall fix the time for setting out fires on any three consecutive days therein named, and no fire shall be set out later than ten days from date of said permit, and no such fires shall be set at a time when the wind is blowing to such an extent as to cause danger of same spreading beyond the control of the person setting said fire, and without sufficient help and tools present at time of setting and

thereafter until out, to control the same, and the said fire shall be watched by the person setting the fire until the same is out; and any one violating any provision contained in the preceding portions of this section shall, upon conviction thereof, be fined not less than Twenty-five Dollars (\$25.00), nor more than Five Hundred Dollars (\$500.00), or be imprisoned in the county jail not less than ten (10), nor more than ninety (90) days, or by both such fine and imprisonment.

The forester, any of his assistants, any warden or ranger, may at his discretion, refuse, revoke or postpone the use of permits to burn when such action is clearly necessary for the safety of adjacent property. Providing that the provisions of this section shall not apply to any actual settler engaged in clearing his land for agricultural purposes nor shall not apply where the brush is piled up and there is a clear space 30 feet around such pile, but shall apply to all burning of slashings.

Section 4. Any person who shall upon any land within this state set or leave any fire that shall spread and damage or destroy property of any kind not his own, shall upon conviction, be punished by a fine of not less than Ten Dollars (\$10.00), nor more than Five Hundred Dollars (\$500.00). If such fire be set maliciously, whether on his own or on another's land, with intent to destroy property not his own, he shall be guilty of a felony, and shall be punished by imprisonment in the state penitentiary for not less than one, nor more than fifty years.

During the closed season, any person who shall kindle a camp fire on land not his own, in or dangerously near any forest material and leave same unquenched, or who shall be a party thereto, or who shall by throwing away any lighted cigar, cigarette, matches or by the use of fire arms, or in any other manner, start a fire in forest material not his own, and leave same unquenched, shall upon conviction, be fined not less than Ten Dollars (\$10.00), nor more than One Hundred Dollars (\$100.00), or be imprisoned in the county jail not exceeding sixty (60) days.

Section 5. The forester, his assistants, wardens, rangers and all police officers are hereby empowered to make arrests without warrant of persons violating this act.

Section 6. Whenever an arrest shall have been made for a violation of any of the provisions of this act or whenever information of such violation shall have been lodged with him, the prosecuting attorney of the county in which the criminal act was committed, shall prosecute the offender or offenders, with all diligence and energy. If any county attorney shall fail to comply with the provisions of this act, he shall be guilty of a misdemeanor, and upon his conviction shall be fined not less than One Hundred Dollars (\$100.00), nor more than One Thousand Dollars (\$1,000.00); and upon his conviction the district court wherein he is convicted shall forthwith declare his office vacant, and notify the proper appointing power thereof. Action against the county attorney shall be brought by the attorney general in the name of the State of Montana. The penalties of this section shall also apply to any magistrate, with proper authority, who refuses or neglects to cause the arrest and prosecution of any person or persons, when a complaint under oath of a violation of any of the provisions of this act has been lodged with him.

Section 7. Any person who shall upon any land within this state, whether on his own, or on another's land, set or leave any fire that shall spread and damage or destroy property of any kind not his own, shall be liable for all damages caused thereby, and any owner of property damaged or destroyed by such fire may maintain a civil suit for the purpose of recovering such damages. Any person who shall upon any land within this state, whether on his own or on another's land, set or leave any fire which threatens to spread and damage or destroy property shall be liable for all costs and expenses incurred by the State of Montana, or by any forestry association, or by any person extinguishing or preventing the spread of such fire.

Section 8. All fines collected under this act shall be paid to the county treasury of the county in which the offense was committed, for the benefit of the common school fund of such county.

Section 9. All acts and parts of acts in conflict herewith are hereby repealed.

Section 10. This act shall be in force and effect from and after its passage and approval, March 7th, 1919.

Senate Bill No. 112.

A Bill for an Act Entitled: "An Act Providing for the Burning or Otherwise Disposing of Brush, Slashings and Inflammable Materials Upon Timber Lands in the State, and Providing a Penalty for the Violation Thereof."

Be It Enacted by the Legislative Assembly of the State of Montana:

Section 1. Any person, firm or corporation who shall hereafter cut or remove any timber, logs, ties, poles, wood, or other forest products from lands within the State of Montana, whether public or private, shall burn or otherwise dispose of the brush, slashings, and all inflammable materials incident to such cuttings, within one year from the date of such cuttings.

Section 1A. All owners of lands in the State of Montana from which there has been cut or removed since the first day of October, 1918, any timber, logs, ties, poles, wood or other forest products, and upon which there is now any brush, slashings or other inflammable materials incident to such cuttings, shall within two years from the passage of this act, burn or otherwise dispose of such brush, slashings or other inflammable materials.

Section 2. None of such materials referred to in the preceding sections shall be burned during the period from June 1st to September 30th, inclusive of each year, without first obtaining permission in writing from the State Forester, or one of his subordinate officers. Such permit shall fix the time for burning such materials, and the rules and regulations under which such materials shall be burned. Provided, however, that the provisions of this act shall not apply to any actual settler engaged in clearing his land for agricultural purposes, but shall apply to all burning of slashings.

Section 3. Any person, firm or corporation failing to comply with, or violating any of the provisions of this act shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in a sum not less than Twenty-five (\$25.00) Dollars nor more than Five Hundred (\$500.00) Dollars, or by imprisonment in the county jail not less than ten (10) days nor more than ninety (90) days, or by both such fine and imprisonment.

Section 4. All acts and parts of acts in conflict herewith are hereby repealed.

Section 5. This act shall be in full force and effect from and after its passage and approval, March 7th, 1919.

Spark Arresters—Chapter 23.

"An Act Requiring All Persons or Corporations Using Coal Burning Locomotives, Skidders, Loaders and Portable Engines to Equip the Same with Spark Arresters, and Providing a Penalty for Violating the Provisions of this Act."

Be It Enacted by the Legislative Assembly of the State of Montana:

Section 1. That all persons or corporations using coal burning locomotives, skidders, loaders and portable engines shall equip and keep in proper and workable condition the same with approved and suitable spark arresters so as to prevent the escape of sparks liable to communicate fire.

Section 2. Any person or corporation failing to comply with the provisions of Section 1 of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than Fifty (\$50) Dollars nor more than Five Hundred (\$500.00) Dollars, and each day such locomotive, skidder, loader or portable engine is used without a suitable spark arrester shall constitute a separate offense.

Section 3. All acts and parts of acts in conflict herewith are hereby repealed.

Section 4. This act shall be in full force and effect from and after December 1, 1919.

Approved August 11, 1919.

Careless Setting of Fires—Chapter 13—H. B. No. 9.

"An Act to Prohibit the Negligent and Careless Setting of Fires on Lands Owned by One, or Occupied by Him, by Which the Property of Another Shall Be Endangered or Damaged, and Fixing the Punishment Therefor."

Be It Enacted by the Legislative Assembly of the State of Montana:

Section 1. Every person who shall negligently or carelessly set on fire, or cause to be set on fire, any woods, timber, prairie, or other combustible material, whether on his own land or not, by means whereby the property of another shall be endangered, or shall negligently suffer any fire upon his own lands, or lands occupied by him, to extend beyond the limits thereof, shall be guilty of a misdemeanor, and is punishable by a fine of not less than One Hundred Dollars, nor more than Five Hundred Dollars, or by imprisonment in the county jail for not less than one month, nor more than six months, or by both such fine and imprisonment.

Section 2. All acts and parts of acts in conflict herewith are hereby repealed.

Section 3. This act shall be in full force and effect from and after its passage and approval.

Approved February 22, 1918.

PRODUCTION OF FOREST PRODUCTS IN MONTANA.

Number and Size of Sawmills.

There were 98 sawmills in operation in the state during the year 1918, each producing an annual cut of 50,000 board feet or more. The following tabulation shows the number of mills classified according to production:

Annual Cut	No. of Mills
10,000 M or more	8
5,000 M to 10,000 M	2
1,000 M to 5,000 M	12
500 M to 1,000 M	8
50 M to 500 M	68
TOTAL	98

In addition to these mills there were 36 mills in operation cutting less than 50,000 board feet per year. The total number of sawmills of all sizes owned in Montana as shown by the 1918 census was nearly two hundred. *This number would include 61 mills, mostly of small capacity, which were idle during 1918.

All of the large mills with an annual cut of five million feet or over are located in the western part of the state, while the majority of the mills cutting less than one-half million board feet per year are located east of the Continental Divide.

*Active mills cutting more than 50,000 feet each	98
Active mills cutting less than 50,000 feet each	26
Mills reporting idle	61
Total mills reporting	195

Annual Lumber Production.

Statistics on the annual production of lumber in the state for the ten-year period from 1909 to 1918, inclusive, are given below:

TOTAL REPORTED PRODUCTION:

	Feet Board Measure
1918	335,811,000
1917	350,000,000
1916	383,900,000
1915	328,000,000
1914	317,842,000
1913	357,974,000
1912	272,174,000
1911	228,416,000
1910	319,084,000
1909	308,582,000

The final compilations from the fourteenth decennial census, which included the collection of statistics on the lumber cut of Montana sawmills for 1919, are not available for this report, but from the preliminary figures issued it is judged that the 1919 production would equal or exceed the 1918 cut.

The lumber production by species for 1918 follows:

Kind of Wood	Quantity in Board Feet
Yellow Pine	169,956,000
Larch	114,250,000
Douglas Fir	34,906,000
Spruce	6,773,000
White Fir	4,523,000
White Pine	4,207,000
Lodgepole Pine	729,000
Cottonwood	467,000
TOTAL	335,811,000

These figures are based upon data compiled from reports of operators who manufacture more than 50,000 board feet per year. After including mills cutting less than 50,000 board feet, and making allowance for a few mills of the

latter class which may have failed to report, the total computed production for 1918 is placed in round numbers at 340,000,000 board feet.

This aggregate includes lumber manufactured from federal, state and private holdings. The total value f. o. b. the mills on this amount of lumber, taking as a basis average prices paid to the manufacturers in 1918, is roughly estimated at \$7,200,000.

Total Cut All Forest Products.

In addition to the lumber manufactured the sawmills reported the production of 21,903,000 pieces of lath and 5,285,000 shingles.

In 1918 the mining industry of the state used approximately 170,000,000 feet of timber of which about 134,000,000 was in the form of lumber and sawed timber already included in the figures given for the total lumber cut. The stulls consumed amounted to 33,000,000 feet of native timber besides quantities of lagging and converter poles amounting to 3,000,000 feet during the year. This immense quantity of timber was furnished with the mines working at top capacity, though the production did not materially exceed that of 1917, or even preceding years, because copper had been shipped in great quantities before the United States entered the war.

In round numbers the total estimated production of lumber and other wood products, including stulls, lagging, converter poles, cordwood, hewn ties, posts, piling, lath and shingles, for 1918, is estimated to be equivalent to a cut of 500,000,000 feet board measure.

This amount is somewhat less than that shown for the year 1916, when the lumber cut considerably exceeded the average over a period of ten years. Under normal conditions it is unlikely that the total annual production will fall below 500,000,000 board feet.

MONTANA.

Area in Square Miles..... 147,387

Area in Acres 94,196,480

It is the third largest state in the Union.

The whole area of the state may be roughly estimated and classified as one-third forest, one-third grazing, and one-third agricultural lands.

Eighteen (18) national forest reserves have been created in Montana, embracing a gross acreage of 19,400,000 and a net forest area of 16,027,000 acres.

TIMBER RESOURCES.

From the most reliable data now available, Montana's present stand of living timber, of merchantable size, is estimated at 58,000,000 board feet, log scale.

This vast body of timber is made up of the following species in approximately the proportions given: Douglas fir, 22 per cent; western yellow pine, 21 per cent; lodge pole pine, 20 per cent; western larch, 11 per cent; Englemann spruce, 8 per cent; cedar, 3 per cent; white pine, 2 per cent; miscellaneous, 13 per cent.

It is estimated that 29 per cent of this timber is privately owned, 4 per cent is held by the state, and the remaining 67 per cent is the property of the federal government.

Conservative estimates by the Forest Service indicate that the business of lumber manufacture in Montana represents an investment of about \$22,000,000. This great industry is second only to agriculture and mining. With the proper handling of the forest resources, the lumber business of Montana will always be one of its greatest industries.

The annual cut of timber in Montana has reached a volume of about 500,000,000 feet.

From June 30th, 1917, to June 30th, 1918, the following cut has been reported.

	Feet
United States Forest Service.....	82,771,000
Indian Reservations	17,000,000
State and Private	250,000,000
Total	349,771,000

Summing up, the commercial value of the forests of the state, in all ownerships, represents an aggregate community wealth of approximately \$1,400,000,000.

To a state whose greatest resources are its agricultural lands, the value of such a body of timber is incalculable. In developing the great agricultural possibilities, enormous quantities of timber are needed for building purposes.

FARM AND CITY TREES. WINDBREAKS.

Value of Windbreaks. As the farming section of Montana becomes more and more settled, the need for protection from winter winds becomes constantly more evident, and it will only be a matter of a comparatively few years before windbreaks will have their place on every ranch throughout this region. As the trees grow they will protect dwelling houses, barns and stock, later yielding fence posts and firewood, and finally even rough lumber for building purposes. A windbreak properly planted at this time can not fail to add to the value of the ranch, it being well known that a farm having a windbreak on it always sells at a higher rate than the same land barren of tree growth.

Before planting is commenced the following essentials should be carefully considered:

Essentials in Planting. 1. What are the directions from which the cold winds blow? If they come from the north and west, the windbreaks should be placed in an L-shape on the north and west sides of the building; if from the south and west, place the break on these sides. In some cases it may be advisable to plant on three sides, but it is usually not desirable to completely surround the buildings with trees.

2. Never place the trees closer than 100 feet from the principal buildings, otherwise snow—which accumulates in drifts on the inner side of the break—will tend to block up the yard. If feasible, the windbreak may be 200 or even 300 feet from the buildings, and still afford ample shelter.

3. In order to have a windbreak which will effectually stop the wind, it should not be less than 40 feet in width, and may be advantageously as wide as 100 feet. The wider it is (within limits) the greater the protective value. Its length will depend on the number of buildings to be protected, the ordinary length of a windbreak being 300 to 500 feet.

4. Plow the area on which the trees are to be planted, and allow it to lie fallow or planted to a cultivated crop for one year. This is absolutely essential under conditions prevailing in eastern Montana. Plant the trees the spring after plowing, as soon as native vegetation starts.

QUALITIES AND USES OF THE MORE IMPORTANT MONTANA WOODS.

Western Pine (*pinus ponderosa*) is the chief lumber producing tree of Montana. The wood is light and resinous, the grain fine but often twisted, and the growth variable. It is not especially durable when in contact with the soil, lasting on the average about five or six years. Forest Service strength tests made of small clear specimens cut from trees collected in Montana gave a modulus of rupture of 4,950 pounds per square inch and a crushing strength of 2,370 pounds per square inch.

The tree produces an average of about 13 per cent select grades, 12 per cent shop lumber and 75 per cent common grades. The wood is very extensively used in the mines at Butte and has a large variety of other uses, ranging from the coarsest construction to the high finished product. A large part of the total amount produced in Montana is consumed within the state, but quite an amount is also shipped out.

Western Larch (*larix occidentalis*) produces very nearly as much lumber in Montana as does western pine. The wood is heavy, of fine growth, but is not very durable when placed in conditions subjecting it to decay. Forest Service strength tests of small clear specimens cut from trees collected in Washington gave a modulus of rupture of 7,250 pounds per square inch, and a crushing strength of 3,700 pounds per square inch. The tree does not produce much select lumber, 92 per cent going into the common grades and 8 per cent into the select. The wood is used to quite an extent by the Butte mines and also for general building and construction purposes, for ties and for paving blocks. A considerable quantity is shipped out of the state to the prairie states of the Middle West.

Douglas Fir (*pseudotsuga taxifolia*) is one of the smaller lumber producing trees of Montana. The wood is considerably lighter than larch but heavier than the western pine in the dry condition. The fir grown in Montana is rather knotty and coarse grained, but is slightly more durable in contact with the soil than either larch or pine. Forest Service strength tests of small clear specimens cut from trees collected in Wyoming gave a modulus of rupture of 6,340 pounds per square inch, and a crushing strength of 2,920 pounds per square inch. The tree cuts out a very small percentage of selects, 98 per cent going to common lumber and only 2 per cent in the select grades. In Montana fir and larch are graded and sold together owing to the very small percentage of selects in each of these species. The wood is used in the Butte mines and for general rough construction purposes and ties. Most of the output is consumed within the state.

Lodge Pole Pine (*pinus contorta*) is one of the minor lumber producing species of Montana. The wood is rather light, of slow growth, and not durable when placed in conditions subjecting it to decay. The Forest Service strength tests of small clear specimens cut from trees collected in Wyoming gave a modulus of rupture of 5,170 pounds per square inch, and a crushing strength of 2,400 pounds per square inch. Only a small percentage is manufactured into lumber and if so manufactured yields mostly common lumber, only 7 per cent going into the selects, while 93 per cent goes into common grades.

This wood is the chief source of stulls, lagging and converter poles for the Butte mines, where enormous quantities are consumed annually. It is also used for ties and fuel and to a slight extent for fence posts and telephone poles. Practically the whole output is consumed within the state.

PROPOSED TIMBER LAND EXCHANGE.

An agreement was made and entered into the 23rd day of December, A. D. 1912, between the Department of Agriculture of the United States and the State of Montana, looking toward a settlement and adjustment of all matters relative to the unsurveyed school lands within the national forests in the State of Montana. This agreement provides that all unsurveyed school sections included within the boundaries of the national forests shall be relinquished by the state and that said unsurveyed school sections be used as a basis for the selection by the state in lieu thereof other lands equivalent in acreage and value, in one or more compact bodies, lying along and within the boundaries of the national forests, in such position that when eliminated therefrom all will lie outside the boundaries.

In pursuance of said agreement the state and National Forest Service caused to be examined and cruised a great many of said unsurveyed school sections, and tentatively selected two areas, one located in the Stillwater and Whitefish districts, comprising 69,180 acres, and one in the Swan River valley of 37,180 acres, a total of 106,360 acres, being in Flathead and Lincoln counties.

Lists have been prepared and approved, equalizing, as near as possible, acreage and timber value, both the tracts to be relinquished and the areas selected.

Under date of November 27, 1918, the President of the United States of America, Woodrow Wilson, under and in conformity with said agreement of December 23rd, 1912, duly issued a proclamation excluding the said selected areas from the national forests, and granting the state ninety days from the date of the proclamation within which to file its selections for all surveyed lands eliminated, and ninety days from the approval of the official plat of survey of any unsurveyed lands embraced within the areas excluded.

In conjunction with the State Board of Land Commissioners action has been taken to comply with the terms of the proclamation.

The early consummation of this timber land exchanged affords this department very much satisfaction. It will give the state compact and very valuable timber tracts, making their preservation and administration more economical and satisfactory. And it is to be hoped the area may be further enlarged by selections based on other isolated school sections.

The Swan River area has all been surveyed and action by the Interior Department should soon be taken conveying title to the state, upon which this department would assume jurisdiction of the area.

Only a very small portion of the Stillwater area is surveyed and this condition delays the matter, as the Interior Department can only transfer the tracts to the state as they are surveyed from time to time.

A survey of the Stillwater-Whitefish area has been urged and we can reasonably hope for an early completion of the survey.

HANDLING LODGE POLE PINE.

Reprinted from the "Timberman."

Lodge pole pine as an individual species also presents an individual problem in forest products. Round stull material cut from the Deer Lodge and Missoula national forests is used very extensively in the Butte mines and prop material from the Beartooth forest supplies the coal mines at Red Lodge, Mont.; but except for these instances of use for mining timbers, the utilization of lodge pole is on a very small scale in the region at this time. On eight of the "lodge pole" forests in Montana in 1919 the total authorized cut was over 150,000,000 feet and the total actual cut was under 7,000,000 feet—less than 5 per cent. Much of this lodge pole timber is fairly accessible and its use could probably be greatly extended if the use of its products were better understood. The region has enormous mining interests and large quantities of charcoal and flotation oils are used locally in the smelting and refining of the ores. If flotation oils can be economically obtained from lodge pole pine, it

probably would not be difficult to introduce a new industry to the region. The distillation of lodge pole pine offers a fertile and very important field for both technical and economic investigation.

The use of native lodge pole pine for lumber for purposes to which it is suited can undoubtedly be stimulated to a considerable degree. Economic studies of sources, prices and qualities of the present supply in the stocks of the retail lumber yards, together with appraisals of nearby national forest timber, will undoubtedly in time have this result.

Only One Paper Mill in Inland Empire.

Between Minnesota and the Pacific coast, in the United States, there is only one pulp and paper mill. This mill supplies a portion of the Inland Empire region and in addition sends part of its product southward along the Continental Divide. It draws a portion of its supply of raw material from the national forests in northern Idaho, but in proportion to the resources of the whole region its output is very small. There are several units of timber in the region which would support large mills permanently. The amount of tributary timber is known approximately, the cost of delivering logs to the mill sites can be determined without particular difficulty, and it is known that the timber species which predominate on these units are suitable for pulp and paper manufacture. The things that are not known accurately are the economic factors influencing the marketing of the product—distribution, consumption, freight rates, comparative costs of manufacture, size of plant investment, and so on. At a time of high prices in the industry and a possible shortage of timber supply, it would seem that aggressive action to gather the economic data necessary to work out this phase of the problem might easily result in the establishment of one or more new mills in this region. Without detailed information on the economic questions involved, it will be very difficult, if not impossible, for some years, to interest capital in this kind of enterprise.

A HUNDRED PER CENT OVERDRAFT.

Reprinted from the "Literary Digest."

We are growing lumber at the rate of about twenty billion board feet per year. This sounds well, and it would be quite satisfactory if we were not using it at the annual rate of forty billion feet—a huge overdraft on our lumber-bank. Says Logan G. McPherson, in a communication to the New York Sun:

"It is estimated that of the approximately 5,000,000,000,000 board feet of merchantable timber that was originally comprised in the forests of the United States about 2,700,000,000,000 remain. Of this there is owned privately 2,020,000,000,000; by the national government and states, 680,000,000,000. While the annual consumption of lumber is at the rate of approximately 40,000,000,000, the new growth is at the rate of less than 20,000,000,000 board feet. The need is obvious not only for conservation of the existing supply, but for the planting of new trees to maintain an adequate supply for the future. Of the 900,000,000 or more acres of original forest land about 300,000,000 acres have been converted into farms, about 180,000,000 acres have been cut over but are being restocked, while about 65,000,000 acres have been cut over and are not being restocked. The devastation of the forests means that the rainfall quickly runs to the water-courses without imparting needed moisture to the soil and that there is facilitated the erosion which destroys its fertility."

A STATE FOREST POLICY FOR MONTANA.

Contributed by United States Forest Service, District One.

FRED MORRELL, District Forester.

Need for a State Forest Policy.

The movement of the timber cut in the United States is setting steadily westward. With the depletion of timber supplies and consequent reduced annual production in the East, Middle West and South, the western timber lands are assum-

ing every year a greater importance in maintaining the timber supply of the country. Sixty-one per cent of the timber now remaining in the continental United States lies west of the great plains.

The original pine forests of the Lake states, estimated at three hundred and fifty billion feet, are now reduced to less than eight billion. The virgin pine forests of the South are estimated to have contained six hundred and fifty billion feet of timber; they now contain one hundred and thirty-nine billion feet aside from considerable quantities of second growth. The cut of southern pine is falling off and within another decade promises to exceed by little, if at all, the requirements of the Southern states themselves.

These figures are quoted from a recent publication of the U. S. Department of Agriculture. Their significance to the State of Montana is great. They mean that in all probability Montana, together with the other timber producing states of the West, will see a tremendously increased demand for timber to supply the needs of the nation, and that this increased demand will come in the very near future.

The 1918 lumber cut for Montana was 340,000 M. feet. Statistics presented in the 1917-1918 report of the State Forester indicate a possible permanent annual production of around 900,000 M. feet in Montana, provided necessary measures are taken to keep the forest lands of the state in productive condition. If such measures are not taken Montana will repeat the history of the Lake states and the South, a lumber production rising to a crest, followed by a rapid falling off of the annual cut and an eventual practical disappearance of the industry. Since 58 per cent of the merchantable timber in the state is included in the national forests, which the federal government plans to maintain in permanent forest production, this complete destruction of the industry is not to be anticipated, but the private and state lands, the most valuable and productive timber lands of the state, now bearing 34 per cent of the merchantable timber, will not be retained in productive capacity without the adoption by the state of a conservative forest policy.

Present Forestry Organization, Laws and Suggested Changes.

Administration.

The direction and control of state owned lands is vested by the constitution in the State Board of Land Commissioners. A State Forester is provided at a salary of \$2,500.00 per annum to be appointed by the Governor by and with the advice and consent of the Senate, to serve a term of four years. It is specified in the act that he shall be skilled in the science of forestry. The State Forester, under the direction and control of the Land Board, is charged with the duty of handling all the field work in selection, location, examination and appraisement of state timber lands, and under the direction of the board has general charge of the timber lands of the state. He executes all matters pertaining to forestry in the state, has charge of all fire wardens, and enforces the fire laws of the state.

Provision is also made by law for a forestry board, composed of the Register of State Lands (chairman), the State Forester (secretary), and the State Land Agent. The duties of the State Forestry Board are "to ascertain the method of reforesting the denuded lands of the state, to prevent forestry waste and the destruction of forests by fire, to manage the forests of the state on forestry principles, to encourage private owners in preserving and growing timber," etc.

Since practically all these functions are also delegated by law to the State Forester under direction of the Land Board, it would appear that there might be some conflict of authority between the State Forester and the Forestry Board, and that possibly the board as such might be unnecessary, particularly since it is made up of state officials who by virtue of their offices as Register of State Lands, State Land Agent and State Forester, would each have certain specific duties in connection with the state forest lands, and since all of them are employed under the general direction of the State Land Board.

The salary and expense of the State Forester, as well as all other members of the state land office are paid out of the moneys in the several land grant income funds, and apportioned among the several funds in proportion to the amount of land in each of the land grants from which the several funds are derived.

Under this provision fire protection expenditures for protecting state lands, and such incidental protection as is also given to private lands by the state, are paid from the land grant income funds. There has been no direct appropriation for fire protection. The principle of part of the burden of fire protection of privately owned forest lands being carried by the state has been recognized in many states of the Union. Since timber is a natural resource which forms the basis of an important industry, on which the welfare of the state is dependent, and since fire protection is a community rather than an individual problem, it seems proper that the state should share in the expense. In order to do so a direct appropriation for the purpose is required, since general fire protection should not properly be paid from land grant funds.

Many states which have progressive and effective forestry laws have found it advisable to have a nonpartisan Forestry Board appointed by the Governor on recommendation of such agencies as lumbermen's associations, forest-using industries, agricultural organizations and the like. This provides a body of men in an advisory capacity who have the interests of the state and the forest industry at heart, and whose constructive advice in forestry matters has great weight and value.

It would be highly desirable to have the State Forester appointed by the Governor by and with the recommendation of such a board. The proper administration of the state fire and forestry laws requires a State Forester of the highest type in training and ability and with reasonable assurance of permanence of office regardless of changes in the political fortunes of the state administration. The nomination of the Forester by a nonpartisan board would tend in this direction. The present term of office of the State Forester is four years. This should be changed to an indefinite term at the pleasure of the Governor. The salary of the position should be increased to \$3,600.00 per annum. The present salary of \$2,500.00 is not commensurate with the importance of the position.

Fire Protection.

Under existing state laws the State Forester has general charge of fire protection work in the state. He may appoint in such locations as he deems wise, public spirited citizens to act as volunteer fire wardens. Sheriffs, deputy sheriffs, game wardens and deputy game wardens are ex-officio fire wardens, as are also duly appointed officers of the U. S. Forest Service, the Northern Montana Forestry Association and the U. S. Indian Service. Such wardens may arrest without warrant for violation in their presence of any state or federal forest laws.

This is at best only a makeshift system. Volunteer fire wardens and ex-officio officers with other duties cannot be expected to take the place of an organized patrol system.

The law provides a closed season from June 1 to September 30, during which it is unlawful to burn forest material without a permit from a warden. An exception is made, "Providing that the provision of this section shall not apply to any actual settler engaged in clearing land for agricultural purposes, nor shall not apply where the brush is piled up and there is a clear space thirty (30) feet around such pile, but shall apply to all burning of slashings." This exception greatly weakens the purposes of the law. It was inserted in the bill at the demand of certain agricultural sections where it was feared that the operation of the law might hamper the settler in clearing lands. It is believed that two years' operation of the law has demonstrated that its application to the burning of all forest material would not be a hardship to any person, and there would be no serious opposition to extending the provisions of the law to cover clearing agricultural land.

The law also compels burning of brush and slashings resulting from logging operations within a year after such cutting.

This section of the law covering slash disposal is adequate for the purpose, but it has been enforced only to a very limited extent, chiefly owing to lack of an effective organization to inspect logging operations and compel compliance with the law.

The principal lack in the Montana forest fire laws is failure to provide any form of compulsory fire protection on privately owned forest lands. It is a well recognized principle that a state has the authority to legislate for the purpose of preventing any condition on any privately owned property which may be a menace to life or property of other citizens of the state. All forest land in this region is inflammable and fire starting in any forest land is a menace to adjoining property.

Many forest owners of the state have recognized the need of organized fire protection. The Northern Montana Forestry Association, which is composed principally of private owners in the northwestern part of the state, with a membership representing 927,000 acres, has successfully maintained an organized fire protection for some years. The Northern Pacific Railway Company lands within the national forest, amounting to 990,000 acres in Montana, are protected by cooperative agreement with the Forest Service. The state forest lands, amounting to about 500,000 acres, are protected either through cooperative agreement with the Forest Service or by the organization maintained by the State Forester. The total of private and state lands under organized protection then amount to 2,417,000 acres.

There are in the State of Montana, based on the county records, 3,468,000 acres of timber land, and 951,000 acres of cut-over land, or a total of 4,419,000 acres in private ownership which may be classed as forest land requiring fire protection. Adding 500,000 acres of state forest land, makes a total of 4,919,000 acres of state and private forest lands requiring protection. Since only 2,417,000 acres are under organized protection, there remain 2,502,000 acres which are either not protected, or are receiving incidental protection in which they do not share the cost from the Forest Service, the Northern Montana Forestry Association and the state.

It is manifestly unjust to those progressive land owners who contribute to organized fire protection, that adjoining owners should refuse to contribute, and thus either force the contributing owners to protect their lands free of charge or take the risk of fire spreading from unprotected lands. To meet this situation several states have passed compul-

sory fire protection laws. This system has been in effect in Washington and Oregon for several years, and has operated very successfully.

The constitutionality of such a law is unquestioned. It is simply an exercise of the police power of the state in requiring a property owner to remedy a condition which is a menace to life or property, and unprotected forest land with the possibility of fire spreading from it to adjoining property constitutes such a menace. This is the foundation on which compulsory patrol laws are based.

Such a law should provide in brief:

(1) For division by the State Forester of the forest lands of the state into fire districts.

(2) It should stipulate that every owner of forest land in any designated fire district in the state shall provide adequate protection from fire which meets the approval of the State Forester, provided that forest land shall be deemed adequately protected if the owner shall provide patrol and protection equal to that provided by other owners in the same fire districts who maintain organized patrol with the approval of the State Forester.

(3) If any owner of forest land neglects to provide adequate fire protection as required, the State Forester should be authorized to provide such protection, the actual cost plus ten per cent for interest charges and collection, to be a lien on the property patrolled, and to be reported by the State Forester to the County Assessor, who should extend the amounts upon the tax rolls covering such property, and the amounts should be collected at the time and in the same manner as taxes on the property.

(4) For purposes of this law any land should be considered forest land which has enough timber standing or down, or inflammable debris or material to constitute, in the judgment of the State Forester, a menace to life or property.

(5) The fire districts of the state should be of two classes, organized and unorganized. An organized district should be formed by request of owners of over 50 per cent of the forest land in the district. The owners should then, through the formation of an association, have direct control of the fire protection organization and finances in the

district, subject to approval of the State Forester, as to the adequacy of the protection, and should nominate their own chief warden for appointment as a state fire warden by the State Forester.

This would have the effect that in an organized district, if any owner declined to become a member of the association, the State Forester would assess against his property a cost equal to the association assessments for the year plus 10 per cent, and might contract with the association to handle the protection.

In unorganized districts the protective organization should be provided directly by the State Forester, and the cost assessed against the owners.

State Forest Lands.

The direction, control, leasing and sale of state lands is vested by the state constitution in the State Board of Land Commissioners.

The State of Montana now owns about 500,000 acres of forest land, most of which is timber land of good quality.

It is generally accepted that the function of maintaining a permanent timber supply for the nation must rest to a large extent in the state and federal governments. The forest lands of the state should be maintained as a permanent timber producing resource. Cutting of timber should be permitted only under such provisions as will secure the renewal of the forest growth. Managed in this way the state forests will produce a permanent and steadily increasing revenue, besides tending to stabilize the forest industries of the state.

For convenience in administration the state forest lands which are chiefly valuable for forest growth should be consolidated as far as possible by exchange, and should be permanently segregated as forest lands not subject to sale.

Encouragement of Forestry Practice on Private Lands.

Fire protection is fundamental to the success of the practice of forestry. It is idle to talk of rendering forest lands permanently productive until the fire risk is reduced to a reasonable degree. It is so important as to be considered at least three-fourths of the problem of forestry at the present time.

In the long run, however, fire protection is only the first step to the practice of forestry and will have to be followed by better methods of cutting in order to secure a more certain reproduction after cutting, and to maintain forest lands in a high degree of productiveness. For the present, however, fire protection must be given first consideration. Other measures may follow later.

Summary of Legislation Needed.

I. Creation of State Forest Advisory Board.

A board of five members to serve without pay except expenses. The members to be appointed by the Governor on nomination of representative interests of the state. As a suggestion it might be composed of the dean of the Forest School of the University of Montana, ex-officio, and four other members to be nominated by the President of the State Agricultural College, the Montana Lumbermen's Association, the Timber Protective Associations of the state and the Forest Service.

The function of this board should be purely advisory. It should advise the Board of Land Commissioners and the State Forester on policies of handling state forest lands, and administration of the fire and other forest laws. It should recommend needed forest legislation, and should select and nominate a State Forester to be appointed by the Governor.

II. State Forester to be appointed by the Governor on nomination of the Forest Advisory Board.

He should serve for an indefinite term at the pleasure of the Governor and the salary should be increased to \$3,600 per annum. Since his duties are two-fold (1) administration of state forest lands under direction of the Land Board, and (2) administration of the state fire laws and all other forestry activities of the state; he should have a special appropriation for the conduct of his office, since only a part of his activities (those relating to state lands) could properly be paid from the land grant income funds.

III. Extension of requirement of burning permits during closed season to all classes of forest land, that is, eliminating the exception in the case of settlers clearing land for agricultural purposes.

IV. Enactment of a compulsory fire patrol law along the lines indicated in the preceding pages.

V. Establishment of a definite state policy for management of the state timber lands as a permanent forest, concentrating these holdings so far as possible, and segregating them as permanent forest lands.

VI. Recognition of the function of the state to stand a portion of the cost of fire protection on privately owned forest lands, and a special appropriation for that purpose.

State and Federal Cooperation.

The Forest Service has for some years cooperated with the various states in fire protection, under the provisions of the so-called "Weeks Law," which provides for financial cooperation by the federal government not to exceed the amount appropriated by any state for fire protection of the headwaters of any navigable stream. Federal contributions from this source in Montana have amounted to \$3,000 to \$3,500 a year.

Recognizing the interest and responsibility of the nation in safeguarding its future timber supply it is now proposed to greatly extend this cooperation as an encouragement to the practice of forestry in the several states, providing necessary legislation can be secured in Congress. The approval of the Secretary of Agriculture has been obtained for incorporating in the next Forest Service appropriation bill a large sum for cooperation with the states in fire protection and forestry.

If such appropriation is made it is the plan of the Forest Service that such cooperation should combine three essential features:

(1) The Forest Service, in cooperation with state officers or other agencies as far as practicable, should determine and recommend the essential and standard requirements for keeping forest lands in continuous production in each region.

(2) The Forest Service should be enabled to offer liberal financial cooperation to the several states, not only in fire prevention, the principal and most important cooperative activity, but in any phase of forestry or forest research, including planting.

(3) The Forest Service should be empowered to withhold cooperation in whole or in part from states which do not comply in legislation or administration practice with the standard requirements determined upon.

Such cooperation contemplates eventually such control and financial assistance by the states of cutting on privately owned lands as will be necessary to keep forest lands in continuous productive condition.

It will not be expected that such control will be immediately effective, but that it will rather be a gradual growth, and in the requirements imposed as a prerequisite to immediate financial cooperation it is believed to be the wiser federal policy to concentrate for the first few years upon reducing the fire hazard of forest properties, including the slash hazard, and upon bringing all classes of forest lands, cut-over lands, young growth lands, etc., as well as merchantable timber, under systematic protection. The fire hazard is three-fourths of the forestry problem, and it must be brought under a fair degree of control in each forest region before successful public regulation of cutting methods can be brought about. The general plan of the Forest Service, therefore, would be to limit the prerequisites of financial cooperation in each region to protective requirements until its fire hazard has been brought under a reasonable degree of control. As rapidly as that is accomplished, the prerequisites of continued federal cooperation should be expanded to include state requirements for regulating timber cutting which are essential to keep forest lands productive. This point will obviously be reached in certain regions or states sooner than in others, and the time when the Forest Service would expand its requirements would vary accordingly.

The first step in determining the amount of federal cooperation in any state is an estimate of the annual cost of efficient protection of all areas and classes of land in the state, including virgin timber, cut-over and burned land.

Toward this complete protection cost it is believed that, as a principle, the land owners whose property is protected should contribute one-half and the public one-half, the public half being divided equally between the state and the federal government. It should be the policy of the Forest Serv-

ice, therefore, as rapidly as its funds permit and as essential protective requirements are met, to meet 25 per cent of the cost of complete protection in each state.

Just how the state raises the remaining 75 per cent should not concern the Forest Service insofar as cooperative allotments are concerned. The position of the Service is that the preferable course is to put half of the total cost upon the owner of the land in the form of a special assessment, or a compulsory patrol law, or some other method of accomplishing this result. That course will be recommended to the various states as occasion arises. The federal legislation should contain a provision that the expenditures of private owners required by state law, whatever the method, should be recognized in the allotment of federal funds as a means of encouraging some plan of direct participation of the private owner whose property is protected. But, in actual allotments, it is not believed that the Forest Service should stipulate how the cooperating state finances its end of the enterprise, and if it prefers to do so by general appropriations that would be accepted. Expenditures for protection by private owners, to be recognized in the allotment of federal funds, must be required by law. Voluntary protection by the private owner is not stable, since there is no assurance that it will be continued after the merchantable timber is cut, and such protection cannot be considered as an effort toward rendering forest land permanently productive.

How would such an arrangement work out in Montana? As previously stated the total acreage of private lands in Montana is approximately 4,419,000 acres. At an estimated annual cost of 4c per acre complete protection would cost in the neighborhood of \$176,000. Assuming that this is paid one-half by the private owner and one-quarter each by the state and federal governments, the state and federal appropriations would each amount to \$44,000.

The ultimate goal will be reached providing federal funds are available, and providing the state complies with all of the requirements established for keeping the forest lands of the state in continuous production.

RELATION OF FORESTS AND WILD LIFE.

From the earliest times forestry has been associated with game and fish production. Back as far as the year 1598 the Englishman, Manwood, in his treatise on the "Laws of Forests," defined a forest as "a certain territory of woody grounds, fruitful pastures, privileged for wild beasts and fowls of forest, chase and warren to nest and abide in, in the safe protection of the king."

Since Manwood's time, the functions of the forest have greatly increased, so that instead of being solely valuable as a pleasure ground, they are now chiefly valuable for the production of wood and the conservation of water, but their usefulness for recreation and as a home for wild life is still very great and in their management this value should receive full consideration.

The Creator, in his system of checks and balances, placed within the forest a large variety of wild life, all of which have a certain relation to each other and to the forests. On the one hand the forest furnishes food, protection and other necessary elements for all sorts of animal, bird and fish life, while on the other hand, the bird life of the forests has a very beneficial effect upon the forest and agricultural resources of the nation, in that they act as a "balancer" of insect life, which causes immense losses to agriculture and





forestry. The total estimated damage yearly to forests and far mcrops by insects has been placed at \$520,100,000. The greater part of the diet of all except predaceous birds is of insect origin. Under favorable conditions from 65 per cent to 85 per cent of the hibernating codling-moth larvae is destroyed by birds. The bob-white quail, pheasant, woodpecker, and a large variety of other birds eat immense quantities of insects, especially during the nesting season, when working from 16 to 18 hours per day and feeding their young sometimes as often as 200 times a day. The bird and animal life of the forest has a distinct bearing on the distribution of all kinds of plant and forest life through the dissemination of the seeds therefrom.

In a number of instances the re-establishment of forest and plant life on areas devastated by forest fires can not be accounted for by any other theory than by the presence and activities of bird and wild animal life. In addition to the direct relations of wild life to the forests of Montana, there are other more or less direct values which to the people are real and important, and while it is difficult to place a monetary value on them, there are two main items of comparative value:

- (a) Economic.
- (b) Recreative.

Economic:

Since without forest cover wild life soon ceases to be of importance, it naturally follows that forests have a direct bearing on the amount of wild life in Montana, which is instrumental in placing our Treasure State high in the rank of the big game states of the nation. In reckoning the value of our forests, consideration must be given to the wild life which they afford. The direct returns, from an economic standpoint, **from this forest asset**, are the actual value of food produced, such as big game, fish and birds, as well as such other products as furs. There is a very direct revenue in the receipts for hunting and fishing licenses, and, as a result, of the tourist travel. Detailed records of the number of tourists and the money spent by them for a given section, even when reduced to the profit alone, represent a surpris-

ingly high value. A large amount of industry and employment is dependent upon this resource, where it has been intensively developed.

For several years the deer shipped over railroads in Maine have annually averaged about 4,000 head; an estimated total of about 15,000 being killed annually. Pennsylvania furnished a total of 10,000 deer last season, and New York 15,000. Estimates based on reliable data give \$13,000,000 a year as the expenditures of recreationists in Maine. New York state received \$250,000 from licenses. The value of skunk skins alone taken in New York was over \$1,000,000. Montana, with its 16,000,000 acres of forest land, is capable of producing 15,000 deer annually, 3,000 to 5,000 elk, and a large quantity of game, birds, fish and fur-bearing animals, the monetary value of which would range near a quarter of a million dollars annually, and add materially to the recreation and health of our people.

Recreation:

In thinking of recreation we are inclined to consider it in the light of a frolic or pleasure, failing to weigh the physical and mental aspect and how it tends to the building of human qualities. Montana has been richly endowed with recreative fields, which are made doubly attractive by the presence of wild life. There is an increasing demand by hundreds and thousands of people throughout this nation for the opportunity to see nature in all her glory, and each year finds a large number attracted to our Treasure State. These people come primarily for sport and rest which the acquisition of game and fish and sojourn in the forest affords them; the value of their prizes is given only a secondary consideration by them. In this way the forest and its allied resources of wild life may be translated directly into man power, human health and happiness, which is the highest use to which our forests can be put.



AIRPLANE FOREST FIRE PATROL.

This department has been investigating the question of airplanes for forest patrol as a means of quickly discovering forest fires and securing information that will enable protective agencies to reach and suppress such fires at the earliest possible moment, thereby minimizing the devastation and expense.

The method has been given a trial the two past seasons in the states of California and Oregon, and from the best information obtainable it has proved very satisfactory.

The following letter, under date of December 3, 1920, was received from H. H. Arnold, Major, A. S., War Department, Headquarters Ninth Corps Area, Office of the Air Officer, San Francisco, California:

"In view of the fact that there is a strong probability that aerial forest fire patrol will be extended to cover the State of Montana during the coming year, it is requested that you furnish this office a map of the State of Montana, showing the forested and recent burned area."

The department has complied with this request by preparing and forwarding a map of Montana, showing the requested information, as well as base and landing fields, distances, etc.

The War Department has granted permission to use the grounds at Fort Harrison for a landing field.

As the demonstration of this method of forest patrol, with little expense to the state, is possible under present plans, it is hoped the service will be extended to Montana during the coming fire season.

RECOMMENDATIONS.

Forestry Building.

I again desire to call attention to the importance of a Forestry Building to be erected at the State Fair Grounds, at Helena, Montana.

About one-third of the area of Montana is classified as timber lands and in view of this surely forestry and lumbering is of sufficient importance to justify the small expense

to the state of providing such a building, where the products of our forests could be exhibited at our annual State Fair; exhibits permanently housed and available for exhibition at the fairs of other states.

Another important feature of a State Forestry Building is to provide a suitable assembly hall where all classes of meetings may be held during Fair week; particularly for illustrated lectures on forestry, education of the people generally as to the importance of forest preservation, and most important of all to enlist the interest and cooperation of all in the suppression of forest fires.

I therefore sincerely and respectfully urge that the legislative assembly appropriate a sum, not less than Twenty Thousand Dollars (\$20,000), for the purpose of erecting a State Forestry Building at the State Fair Grounds.

Telephone Lines.

In the handling of forest fires a great saving in expense results from means of communication by telephone. There are a few localities where the extension of telephone lines would be of great assistance to this department in forest fire suppression. Some action whereby the Forestry Department might be authorized to aid such communities, in a limited amount, in the construction of such lines, would be amply justified and compensate the state for small outlays.

